Music Therapy in the Treatment of Dementia

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Abstract

Dementia is a degenerative neurological disease affecting 3.4 million people worldwide. The symptoms of the disease are debilitating to the patient causing the eventual inability to care for oneself. The current mainstay of treatment is with acetylcholinesterase inhibitors which aim to slow the progression of the disease. However, not only do these medications cause multiple side effects negatively impacting the patient's quality of life, but they are only at best shown to provide mild stabilization of cognition. Music therapy as a novel method of treatment without negative side effects, is an alternative option to pharmacological therapy. This paper will address the efficacy of music therapy (I), in contrast to the standard of care (C), in improving the quality of life (O) of older adults with dementia (P).

Introduction

Dementia

Overview
- Over 71→ prevalence is about 13.9% or 3.4 million individuals
- Progressive neurological degenerative disease
- Growing elderly population with increased life expectancy

Symptoms
- Loss of memory and cognitive abilities
- Behavioral and psychological symptoms of dementia: depression, psychosis, agitation and aggressive behavior

Treatment
- First line treatments include acetylcholinesterase inhibitors and N-methyl-D-aspartate (NMDA) receptor antagonists
- Music therapy has been researched as a possible non-pharmacological treatment alternative

Methods

Literature search:
- Performed in November 2018
  - PubMed
  - DOAJ
  - EBSCO
- Search Terms: "Dementia and cholinesterase inhibitors effectiveness" and "Dementia and music therapy" and "Dementia and cholinesterase inhibitors and quality of life" and "Dementia and music therapy and quality of life"
- Inclusion Criteria
  - Address the validity and potential bias of each article
  - Peer-reviewed journal
  - Publication date within the last five years

Results

1. **Cho HK. The Effects of Music Therapy-Singing Group on Quality of Life and Affect of Persons With Dementia: A Randomized Controlled Trial. Front Med (Lausanne). 2018;5:279. Published 2018 Oct 15. doi:10.3389/fmed.2018.00279**
   - RCT with 52 participants designed to investigate the effects of music therapy via singing on the quality of life and affect of those with dementia
2. **Behl P, Edwards JD, Kiss A, et al. Treatment effects in multiple cognitive domains in Alzheimer's disease: a two-year cohort study. Alzheimers Res Ther. 2014;6(4):48. 2014. doi:10.1186/alzrt280**
   - Cohort study with 130 participants designed to investigate the long-term efficacy of cholinesterase inhibitors on various cognitive indicators in the treatment of dementia related diseases
3. **Chen YL, Pei YC. Musical dual-task training in patients with mild-to-moderate dementia: a randomized controlled trial. Neuropsychiatr Dis Treat. 2018;14:1381-1393. 2018. doi:10.2147/NDT.S159174**
   - RCT with 28 participants aimed to improve attention control, enhance gait and balance, improve falls efficacy, and reduce agitation through musical dual-task training for individuals with dementia
4. **Dyer SM, Harrison SL, Laver K, Whitehead C, Crotty M. An overview of systematic reviews of pharmacological and non-pharmacological interventions for the treatment of behavioral and psychological symptoms of dementia. International Psychogeriatrics. Published 2018 March;30(3):295-309. doi:10.1017/S1041610217002344**
   - Meta-analysis with 15 studies, or 1400 participants, designed to review the current randomized controlled trials for pharmacological and non-pharmacological management of behavioral and psychological symptoms of dementia (BPSD)
5. **Millán-Calenti JC, Lorenzo-López L, Alonso-Búa B, de Labra C, González-Abraldes I, Maseda A. Optimal nonpharmacological management of agitation in Alzheimer's disease: challenges and solutions. Clin Interv Aging. 2016;11:175-84. Published 2016 Feb 22. doi:10.2147/CIA.S69484**
   - Meta-analysis with 8 studies, or 37-148 participants, aimed to assess research on the effects of non-pharmacological approaches to treatment on the behavioral symptoms of a patient with dementia
6. **Knight R, Khondoker M, Magill N, Stewart R, Landau S: A Systematic Review and Meta-Analysis of the Effectiveness of Acetylcholinesterase Inhibitors and Memantine in Treating the Cognitive Symptoms of Dementia. Dement Geriatr Cogn Disord. Published 2018 May 7;45:131-151. doi:10.1159/000486546**
   - Meta-analysis with 80 studies designed to synthesize data on cholinesterase inhibitors to determine their impact on the Mini-Mental Status Exam (MMSE) for patients with dementia
7. **Ridder HM, Stige B, Qvale LG, Gold C. Individual music therapy for agitation in dementia: an exploratory randomized controlled trial. Aging Ment Health. 2013;17(6):667-78. doi: 10.1080/13607863.2013.790926**
   - Crossover trial with 42 participants directed at investigating how music therapy can improve agitation in individuals with moderate to severe dementia

Comparison of study designs; music therapy vs medications

Study	Design	Total N	Age range	Intervention	Dosing or f/u time	Outcome Measure
Cho et al	RCT	52 (43 male, 9 female)	67-99	MT	4 weeks	QOL-AD
Chen et al	RCT	28 (14 men, 14 female)	67-87	Musical dual-task	2 months	TMT-A, CMAI-C
Behl et al	Cohort	130 people (68 male, 62 female)	61-81	CI	2 years	MMSE, DRS
Dyer et al	MA	15 studies (1400 people)	65+ (mostly 70-85)	CI or MT	Dependent upon study	SMD
Millán-Calenti et al	MA	8 studies with 37- 148 subjects each	65+	MT or bright-light or therapeutic light touch or aromatherapy	4-10 weeks	Various agitation scales
Knight et al	MA	80 studies (unknown total people)	Avg 75	CI, memantine	6 months	MMSE
Ridder et al	Crossover trial	42 people (unknown split M/F)	66-96	MT and standard medical care	14 weeks	CMAI, ADRQL, medication usage

Key: RCT= randomized controlled trial, MA= meta-analysis, MT= music therapy, CI= cholinesterase inhibitor, QOL-AD= quality of life assessment, TMT-A= Trail Making Test Part A, CMAI-C= Cohen-Mansfield Agitation Inventory Scale, MMSE= mini-mental status exam, DRS= dementia rating scale, SMD= standardized mean difference, ADRQL= Alzheimer's Disease-Related Quality of Life

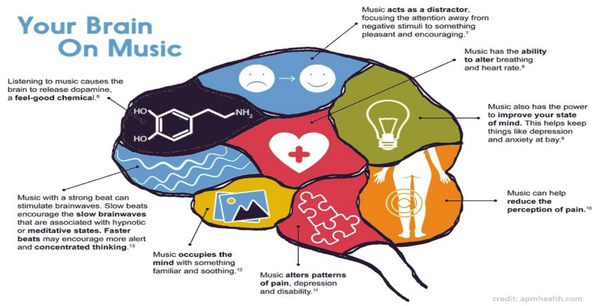
Discussion

Studies were promising but inconclusive on the effects of music therapy as a stand alone treatment option

Strengths:
- Population of patients (representative age range)
- 6/7 studies used blinding and randomization of subjects
- No reported negative side effects of music therapy

Limitations:
- Minimal statistically significant results
- Small sample sizes
- Not all were double-blinded
- Limited timeframe of studies
- Inability to compare due to varying methods of measuring the outcomes

Future Research:
- Larger sample sizes
- Double-blinded and randomized studies
- Long-term effects of music therapy
- Standardized method of measuring the outcomes of the survey



Conclusion

The initial study results are promising as it is shown there are improvements in the individuals who participated without harmful side effects, however more research is necessary to make an absolute conclusion. For those patients whose disease is too advanced to be treated with medications and for those who experienced too severe of adverse side effects of the medications to continue, music therapy is an appropriate and possibly effective alternative to improve quality of life.

Unfortunately these studies lack strength in statistical validity, bringing to attention the need for ongoing research on this topic. While evidence is still lacking in its depth of support, it is still important to consider music therapy as a treatment option when developing the plan of care for a patient with dementia.

Future research should focus on including larger sample sizes, longer treatment timelines and a standardized method of measuring the outcomes of the survey so as to facilitate comparisons with traditional treatments.

Overall, results of this study are positive, unfortunately evidence is insufficient to definitively recommend music therapy over acetylcholinesterase inhibitors.

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